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MODERN TRAINING IN HORTICULTURE

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A Practical Education
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Massachusetts Agricultural College

DIVISION OF HORTICULTURE

Practice in hybridizing

COMPRISING THE FOLLOWING DEPARTMENTS;

POMOLOGY
FLORICULTURE
MARKET GARDENING
LANDSCAPE GARDENING

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UNIVERSITY OF ILLINOIS

Amherst, Mass.
1907

General Statement

THE Massachusetts Agricultural College, located in Amherst, offers unexcelled opportunities for the study of horticulture in all its branches, including fruit-growing, flower-growing, market gardening, landscape gardening, arboriculture and forestry. These subjects are given a commanding place in a strong four years' college course, the rest of the time being given to allied sciences and to general culture subjects. The course is so designed that the student who graduates from it is a broadly trained college man, able to take his place among the educated men of the world. At the same time, he is thoroughly prepared for a useful profession through which he can serve the community and earn a livelihood for himself.

Surveying squad in landscape gardening

A lesson in tillage, class in market gardening

Horticultural Subjects

THE subjects taught in the Division of Horticulture fall chiefly into four groups, namely, pomology, floriculture, market gardening and landscape gardening; but, as nearly all these topics are elective, the courses actually followed by students vary greatly. The separate subjects should be considered first, after which their grouping may be best understood.

Pomology, or the science of fruits and the art of fruit-growing. This subject is taught by Professor Sears, who devotes his entire time to it. The topics are taken up in the following order:

1. The propagation of fruit trees of all sorts, by all methods,—from seeds, layers, cuttings, buds and grafts.

2. Pruning, both theory and practice.

3. Planting and management of orchards, with special reference to the fruits of the temperate zone,—the apple, pear, peach, plum, quince, etc.

4. Planting and management of vineyards.

5. Small fruits and their management, including raspberries, blackberries, currants, gooseberries, strawberries, etc.

6. Spraying,—how to fight insects and fungi,—all the technique of machinery, formulas and methods.

7. Systematic pomology, or the science of fruits. This includes the identification, naming, classification and judging of fruits.

8. Commercial pomology, or how to sell the fruit at a profit. A careful study of the organization of our highly specialized fruit markets and the methods of the modern up-to-date fruit trade. This is unquestionably one of the most important subjects for a fruit grower to understand.

Class pruning grape vines

Floriculture. The aim in these courses is to prepare men, both theoretically and practically, for all lines of greenhouse work. The principal topics taken up in this course are:

1. Greenhouse construction, in which all the modern types of greenhouses and frames are considered, with reference both to principles of construction and of adaptation to the various crops to be grown.

2. Greenhouse details, among which all the various styles of ventilators, gutters, benches, etc., are studied and compared.

3. Furnishings and equipment, dealing with all the apparatus necessary in running a greenhouse, such as pots, fumigators, hose, various kinds of tools, etc.

4. Heating, involving all the methods used, the value of the different systems under different conditions, the various types of boilers, piping, grate surface, coal, etc.

5. Florists' crops, such as roses, violets, chrysanthemums and carnations, bedding plants, decorative plants, are studied in detail, with constant practice work for students.

6. The florists' trade, or the business side of floriculture, discussing the retail and wholesale markets, commission and auction selling, shipping to distant markets, and all that goes to make a profit out of this highly refined specialty.

Frequent visits are made by the class to commercial and private

establishments, giving the students an opportunity to see how things are actually done under a variety of conditions, and offering abundant opportunity to study and criticize houses, crops and methods.

Market Gardening.

This subject, with floriculture, doubtless presents the most refined and intensive types of agriculture known. Moreover, these lines are precisely the ones most highly developed in Massachusetts, so that here we have abundant opportunity to study market gardening right on the ground where it is to be seen at its best. In the immediate vicinity of the College, between Amherst and Springfield, easily accessible by trolley, is a splendid market gardening section, where all the leading truck crops are grown in great perfection. The growing and marketing of garden crops has always been a strongly developed business on the College grounds, where a few acres of excellent truck land are devoted to that purpose.

Amidst these surroundings, the natural thing has been to develop a course of training especially strong in its practical features. Constant contact with the actual work is secured by two very effective methods. The first is through regular class practicums, or field exercises, as carefully planned and equipped as any laboratory exercise in physiological botany or experimental thremmatology. The second

Students budding peach trees

is through the employment of students (at 12½ cents an hour) in the regular garden work.

In the class-room, a thorough course is given in the different crops, their history, methods of growing them, and in all the theoretical and practical problems involved in market gardening, such as localities, labor, capital, tools, crops, rotations, successions, markets, packages, fertilizers, insects, etc.

Running seed drills

Landscape Gardening.

Probably the most extensive, thorough and effective course in this fascinating subject given anywhere in America is that now conducted at Massachusetts Agricultural College. It is a strictly technical course, preparing men for regular professional practice in all the various lines of landscape architecture. Besides such very important subjects as drawing, surveying, engineering, botany, entomology, arboriculture and horticulture, there are offered two full years of work along lines of landscape gardening in the strictest definition. This part of the work is developed in the following order:

Exercise in packing apples

1. The general theory of design and the fundamental principles of the fine arts as exemplified in the art of landscape gardening.

2. Reconnoissance work and

surveying, especially the practical field methods of securing maps by rapid methods. A particularly fine equipment is kept for this work, including the latest models in surveying instruments, some being of Professor Waugh's own design.

3. A critical study of some of the best work of leading landscape architects in America and Europe.

4. The design of grades in all details, including original surveys, designing a new surface, computing and setting the engineer's stakes, computing cuts and fills, making models, estimating cost, etc.

5. Road design, including location, profiles, grades and construction.

6. Planting plans. How to use trees, shrubs, flowers and grass for best effects. (Many persons suppose this to be the whole art of landscape gardening.) Detailed planting lists are made up, nursery estimates secured, and practical exercises in planting are carried out.

7. Design of details, such as fountains, garden seats, pavilions, bridges, etc.

8. Reports, estimates and contracts.

Students in floriculture planting flower beds

9. Lectures on the history of landscape gardening, on the work of leading landscape gardeners, on the esthetic valuation of landscape, and the broad relationships of the art.

Arboriculture is given by Professor White, with special reference to landscape gardening, but is a strong and valuable course in itself, being largely elected by students in general horticulture and floriculture. It deals with all the hardy

native and exotic trees and shrubs used in ornamental planting their propagation, planting and care. Some attention is given also to hardy herbaceous perennials and other materials used in landscape work. As this course is preceded by a half year's work in the propagation of plants, there is ample opportunity for a very thorough study of the subject.

Nursery practice

Forestry is taught by Professor F. Wm. Rane, state forester of Massachusetts. Up to the present time, only a few lectures each year have been given on this subject; but it is hoped that arrangements will soon be completed for a full semester of scientific and technical instruction in this field.

Plant Breeding is of as much importance as animal breeding, but has received much less careful attention. One-half year is given to a thorough study of the scientific principles involved, and to their application in the management of all the crops grown by the farmer, florist and gardener. The course includes concrete studies in variation, practice in crossing and hybridizing, etc. The leading modern theories of evolution are examined in detail, making this course of scientific as well as practical value.

Nursery Practice.

This course, deals with the propagation of plants by all reasonable methods, special attention being given, however, to the practice actually followed in modern nursery work.

Students planting shrubbery

Forestry exercise in the college woods

This subject precedes and naturally leads up to all other work in horticulture. It is given under the management of Professor Sears.

Drawing is taught by Mr. Gracey in connection with landscape gardening. One full year of work covers free-hand drawing, mechanical and map drawing, projections and perspective, the whole being given with reference to its applications in designing and in drafting-room practice. Well-appointed drawing rooms, an excellent equipment, and a well-trained teacher make this work in drawing of incalculable value to those who take it.

Other Subjects Many other subjects are taught in the college outside of the Division of Horticulture. These include agriculture, languages, mathematics, chemistry, civics, economics, etc. Certain of these departments of instruction are particularly strong; so that students who wish to specialize in agriculture or chemistry, for instance, can find the best of opportunities at Massachusetts Agricultural College.

THE WHOLE COURSE

At this point, it will be proper to see how all these subjects are framed together to make up the four-year course. For the first two years, the work is nearly all required, and all students follow the same course. The studies are substantially as follows:

FRESHMAN YEAR, — English, French or German, algebra, geometry, trigonometry, agriculture, botany, chemistry.

Demonstration of gasolene power sprayer

SOPHOMORE YEAR,— English, algebra, French or German, physics, surveying, chemistry, agriculture, horticulture, zoölogy.

During the junior and senior years, the studies are largely elective. The principal subjects are as follows:

JUNIOR YEAR,— arboriculture, pomology, market gardening, landscape gardening, agriculture, botany, entomology, chemistry, drawing, mathematics, zoölogy, English, civics, economics.

Senior year,—pomology, floriculture, plant breeding, landscape gardening, agriculture, veterinary, botany, entomology, English, chemistry, engineering, rural social science.

Those students who wish to follow lines of horticulture or landscape gardening begin their specialization with the junior year, having had one semester of horticulture in the sophomore year, besides valuable preparation in botany, chemistry, agriculture, etc. The subjects recommended for students specializing in the Division of Horticulture are the following, though certain changes in particular cases may be made to advantage:

For those Specializing in Fruit Growing

Junior Year	Senior Year
Pomology	Pomology
Chemistry	Plant breeding
Entomology	Entomology
Botany	Botany, or
Market gardening	Chemistry
Agriculture	

For those Specializing in Floriculture

Junior Year	Senior Year
Arboriculture	Floriculture
Chemistry	Plant breeding
Botany	Botany
Entomology	Entomology, or
Market gardening	Chemistry
Landscape gardening	

For those Specializing in Market Gardening

Junior Year	Senior Year
Market gardening	Market gardening
Botany	Plant breeding
Entomology	Entomology
Chemistry	Botany, or
Agriculture	Chemistry, or
	Pomology

For those Specializing in Landscape Gardening

Junior Year	Senior Year
Landscape gardening	Landscape gardening
Arboriculture	Engineering
Drawing	Floriculture
Entomology	Entomology, or
Botany	Botany
Forestry	

EXPERIMENT WORK

The Division of Horticulture has a fully organized experiment department, in charge of Mr. C. S. Pomeroy. Experiments are under way in many lines, such as propagation of fruit trees, pruning, market garden crops, dwarf fruit trees, plant breeding, the use of enzyms in germination of seeds, thermo-physiological constants, etc., etc. Certain of these experiments are of great interest and value to students in horticultural lines. Graduate students, in particular, find advantage in these experimental studies.

Planting out carnations

EQUIPMENT AND PERSONNEL

The facilities for teaching horticultural subjects to be found in the Division of Horticulture, Massachusetts Agricultural College, are unusual, if not unique. One hundred acres of very fertile land are devoted to orchards, gardens, nurseries, forests, lawns, arboretum and greenhouses. Practical businesslike horticultural work of many kinds is constantly going forward. The most modern tools are used and the best methods exemplified. Wilder Hall, in which most of the classroom instruction is given, is a new modern fireproof building of the best type, and has been pronounced, on good authority, the best building for horticultural purposes owned by any college in America. The landscape gardening department has a very complete outfit of surveying, drawing and mathematical instruments suitable for all kinds of work.

The Division of Horticulture has been organized with the express purpose of putting each line of work into the hands of a specialist. Instead of leaving all horticultural subjects to one

teacher, as has long been the practice in this country, the Massachusetts Agricultural College employs an expert pomologist of long experience to teach pomology, another specialist for floriculture, an experienced market garden man for market gardening, a landscape gardener for landscape gardening, etc. This method of organization cannot help giving much better results. This is the way the present organization is made up :

Division of Horticulture . . . . . F. A. WAUGH, in Charge
Pomology . . . . . Prof. F. C. SEARS
Floriculture . . . . . Assistant Prof. E. A. WHITE
Landscape gardening . . . . . Prof. F. A. WAUGH
Market gardening . . . . . Instructor H. F. TOMPSON
Experiment Work . . . . . Assistant C. S. POMEROY
Drawing . . . . . Instructor F. M. GRACEY
Secretary, Miss C. B. BALL

OPPORTUNITIES AHEAD

Young men who are thinking of college always want to know what opportunities will be opened to them by their college work. It can be said with perfect confidence that the Massachusetts Agri-

Handling carnation plants in the field

cultural College introduces its graduates to more varied employments, more useful careers, more immediate and certain self-support, than any college of any other kind to be found anywhere. This is particularly true for young men well prepared in lines of horticulture and landscape gardening. The college has always been able to place every man of merit in a reasonably good position almost immediately on graduation.

Out of 77 graduates from all departments of the college during the last three years, 39 have gone into the general field of horticulture; which fact in itself shows the large demand for men in these lines. The present occupation of these men may be roughly classified as follows:

Fruit growing	4
Market gardening	1
Landscape gardening	10
Floriculture	3
Contracting horticultural work	7
Teaching and experimental station work	12
On private estates	2

As nearly as can be estimated, those men who work on salaries receive an average compensation of $967 a year. When it is considered that these men are just out of college, this seems to be an encouraging figure.

The best opportunities are unquestionably open to those men who make a way to go into business for themselves, either in floriculture, market gardening or fruit growing. All these lines are remarkably prosperous, especially in New England. The men who are trained for this sort of work are bound to succeed in it. While the average gross returns from farming throughout the United States are only about ten dollars an acre each year, the market gardeners of Massachusetts are averaging $200 to $300, and the best ones are getting $1,000 an acre a year, and more.

Many college graduates go into lines of teaching or investigation. The colleges and experiment stations and the United States Department of Agriculture now employ many thousands of men, practically all of whom must be graduates of agricultural colleges. Salaries run from $600 to about $4,000 a year, beginners usually getting $600 to $800 the first year.

Men trained in landscape gardening are in requisition for the care of private estates, for advanced work in municipal and state parks, and for practical work with professional landscape gardeners. Other men, who prefer to go into speculative business on their own account, undertake landscape gardening and horticultural contracting. A number of our graduates are very successful in these lines. They prune trees or plant trees on contract, spray trees for towns or for private land owners, grade new grounds, make roads, fight gipsy-moth and brown-tails, and perform many other similar services at a profit to themselves and to their clients. This field offers practically unlimited opportunities to men who have the taste and training for it.

Filling a diseased tree

ADMISSION TO THE COLLEGE

Both men and women are admitted to the College on equal terms. Candidates must be fourteen years of age. Graduates of certain preparatory and high schools are admitted by certificate from their instructors; other candidates enter on examination. For practical purposes, the entrance requirements may be counted equal to graduation from a good high school.

EXPENSES

There is no tuition. The incidental expenses for books and laboratory fees amount to about $20 a year. Each student has to have a military suit, costing $15 to $20. Good board can be had in the college dining hall or in private families at $3.25 to $4 a week.

Rooms may be had in the college dormitories or in private houses. The entire cost to boys of economical habits is $250 to $350 a year.

There are abundant opportunities for students to earn a part of their expenses by labor in the Division of Horticulture or in other departments. Occasionally a student pays almost his entire expenses in this way; but such a course is not advised.

POST-GRADUATE STUDY

The Division of Horticulture offers excellent opportunities for graduate students in horticultural subjects. Those who begin with the Bachelor's degree may earn the degree of Master of Science by two years of proper application, while the degree of Doctor of Philosophy may be secured after three years of acceptable work.

Regular graduates of the four-year course receive the degree of Bachelor of Science.

CORRESPONDENCE

Inquiries may be addressed to Kenyon L. Butterfield, President of the College. Questions relating specifically to the work in horticulture and landscape gardening may be addressed to Professor F. A. Waugh, Amherst, Mass.

School garden class on college grounds

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